

Claims

- [c1] A component having a coating on a surface thereof, the coating consisting essentially of zirconia partially stabilized by up to about 10 weight percent yttria and to which is alloyed at least one oxide additive chosen from the group consisting of up to about 5 weight percent lanthana, up to about 5 weight percent neodymia, and up to about 10 weight percent tantalum for a combined maximum of about 10 weight percent of the at least one oxide additive, the oxide additive being uniformly incorporated atom-by-atom throughout the coating.
- [c2] A component according to claim 1, wherein the coating contains only one of the at least one oxide additive.
- [c3] A component according to claim 1, wherein the oxide additive is lanthana.
- [c4] A component according to claim 3, wherein lanthana is present in the coating in an amount of about 0.1 to about 4 weight percent.
- [c5] A component according to claim 1, wherein the oxide additive is neodymia.
- [c6] A component according to claim 5, wherein neodymia is present in the coating in an amount of about 0.1 to about 4 weight percent.
- [c7] A component according to claim 1, wherein the oxide additive is tantalum.
- [c8] A component according to claim 7, wherein tantalum is present in the coating in an amount of about 0.5 to about 8 weight percent.
- [c9] A component according to claim 1, wherein the coating consists of zirconia, yttria, and the oxide additive.
- [c10] A component according to claim 1, wherein the zirconia is partially stabilized by about one to about four weight percent yttria.
- [c11] A component according to claim 1, further comprising a metallic bond coat adhering the coating to the component.
- [c12] A component according to claim 11, wherein the metallic bond coat is a

diffusion platinum aluminide.

- [c13] A component according to claim 1, wherein the component is a superalloy airfoil component of a gas turbine engine.
- [c14] A gas turbine engine component comprising:
a superalloy substrate;
a metallic bond coat on a surface of the substrate; and
a thermal barrier coating having a columnar microstructure, the thermal barrier coating consisting essentially of zirconia partially stabilized by about one to about four weight percent yttria, the thermal barrier coating further containing an oxide additive chosen from the group consisting of up to about 5 weight percent lanthana, up to about 5 weight percent neodymia, and up to about 10 weight percent tantalum, the oxide additive being uniformly incorporated atom-by-atom throughout the coating.
- [c15] A gas turbine engine component according to claim 14, wherein the oxide additive is lanthana and is present in the coating in an amount of about 0.1 to about 4 weight percent.
- [c16] A gas turbine engine component according to claim 14, wherein the oxide additive is neodymia and is present in the coating in an amount of about 0.1 to about 4 weight percent.
- [c17] A gas turbine engine component according to claim 14, wherein the oxide additive is tantalum and is present in the coating in an amount of about 0.5 to about 8 weight percent.
- [c18] A gas turbine engine component according to claim 14, wherein the coating consists of zirconia, yttria, and the oxide additive.
- [c19] A gas turbine engine component according to claim 14, wherein the metallic bond coat is a diffusion platinum aluminide.
- [c20] A gas turbine engine component according to claim 14, wherein the component is an airfoil component.